

REMARKS

Claims 1-7 are rejected under 35 U.S.C. 103(a), as being unpatentable over Pearce et al., U.S. Patent 6,358,865 in view of Barsan et al., U.S. Patent 5,672,521. Claims 8-14 are allowed.

1. Rejection over claims 1-7 under 35 U.S.C. 103(a):

Pearce et al. shows the invention substantially as claimed including a method of forming multiple oxide layers by performing an oxide process, the semiconductor substrate comprising a silicon surface 100, the silicon surface comprising a first region (leftmost region of fig.1) and a second region (rightmost region of fig.1), the method comprising: forming a resist film 110 on the silicon surface to cover both the first region and the second region; forming a mask layer on the surface of the sacrificial oxide layer; defining and patterning the mask layer to form a first opening having a first predetermined surface area, and a second opening having a second predetermined surface area, the first opening and the second opening formed in portions of the mask layer within the first region and portions of the mask layer within the second region, respectively, to respectively expose portions of the sacrificial oxide layer having a surface area equal to the first predetermined surface area, and portions of the sacrificial oxide layer having a surface area equal to the second predetermined surface area; performing a linear nitrogen doping process to simultaneously implant nitrogen ions with a first predetermined concentration and nitrogen ions with a

second predetermined concentration into the first region and the second region, respectively, through the first opening and the second opening, respectively, wherein a ratio of the first predetermined surface area to the second predetermined surface area is defined as a constant k ; removing the mask layer; removing the sacrificial oxide layer; and performing an oxidation process to form a first silicon oxide layer having a first predetermined thickness and a second silicon oxide layer having a second predetermined thickness in the first and second regions, respectively (see figs. 1-7 and col. 2-line 55 to col. 4-line 27).

Pearce et al. fails to expressly disclose forming a sacrificial oxide layer and wherein the oxidation varying dopant is nitrogen, although the reference does disclose the use of nitrogen for varying oxidation rates (see col. 5-lines 36-48).

Barsan et al. disclose implanting nitrogen into two different regions of a semiconductor substrate to vary the oxidation rate so as to form two different oxide regions of different thickness (see figs. 6a-6d and col. 5-lines 16-57) using a sacrificial oxide layer 12 with a thickness of 150 angstroms (see col. 3-lines 34-39). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Pearce et al. so as to replace the fluorine ions with nitrogen ions because nitrogen ions can also be used to affect the oxidation rate and to use a sacrificial oxide layer as disclosed by Barsan et al. because this can be used

to protect the silicon substrate.

With respect to claims 2 and 7, it would have been a function of routine experimentation to adjust the openings in the primary reference of Pearce et al. so as to, for example, form one opening with a greater area, for example, depending upon a variety of factors, for example, the desired length of the device or the desired spacing between adjacent devices and such a limitation would not render patentability to the claims without the showing of unexpected results. It also would have been a function of routine experimentation to adjust the nitrogen doses in order to achieve the desired oxidation rate.

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Concerning claim 6, Pearce et al. disclose where the substrate can be an SOI substrate (see col. 2-lines 44-46).

20 **Response:**

Claims 1-7 are canceled as specified in the above AMENDMENTS TO THE CLAIMS section. No new matter is introduced. A quick allowance of the present application is respectfully requested.

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2. Claims 8-14 are allowed:

Claims 8-14 are allowed.

The following is a statement of reasons for the indication of allowable subject matter: the prior art, either singly or in combination, fails to anticipate or render obvious, the limitations of: forming a mask

layer comprising a first opening with a first predetermined surface area in portions of the mask layer within the first region, and multiple second openings, each second opening having a second predetermined surface area, in portions of the mask layer within the second region, on the surface of the sacrificial oxide layer to respectively expose portions of the sacrificial oxide layer having a surface area equal to the first predetermined surface area, and portions of the sacrificial oxide layer, each having a surface area equal to the second predetermined surface area; and performing an oxidation process to form a first silicon oxide layer having a first predetermined thickness, and a second silicon oxide layer having a second predetermined thickness, in the first and second regions, respectively, as required by independent claim 8.

Response:

The Applicants acknowledge and appreciate the allowance of claim 8-14.

Sincerely yours,

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